Space Weather Forecast

Issued on Monday, 24 January 2022 at 00:45 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Daily Slight Chance of Minor geomagnetic storm G1 through first half of UTC week.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been very low in the past 24 hours, with no significant X-ray flares recorded. A sunspot disappeared from view over the southwestern solar horizon in the 24 hours to leave just one magnetically simple and stable resident sunspot group by the end of the day.

No Earth-directed Coronal Mass Ejections (CMEs) were observed in available imagery.

Solar Wind / Geomagnetic Activity: The solar wind eased from slightly elevated levels to reach background levels by the period's end. The number of particles comprising the solar wind was stable and unremarkable throughout. Their associated magnetic field was slightly erratic in character but small in magnitude, although the north-south component was mostly anti-aligned with Earth's field (to greater effect).

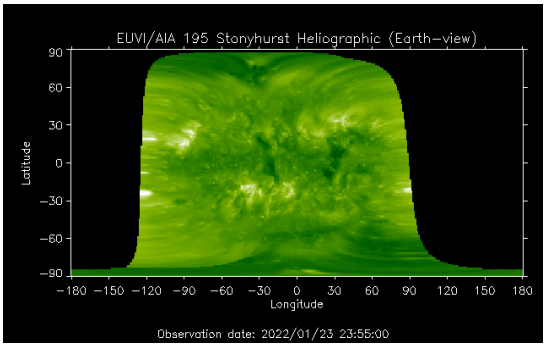
The net effect of the above solar measures was provisionally mostly quiet geomagnetic indices, peaking below G1 Minor Storm in the 03-06UTC interval while the solar wind magnetic field was anti-aligned with Earth's and the wind speed was near its highest.

Energetic Particles / Solar Radiation: No solar radiation storms were in evidence.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to remain very low, with one sunspot on the Earth-facing side of the sun, perhaps offering just a 5% chance of common-class flares per day.

Figure 1: False-colour cylindrical projection of the whole sun in extreme UV, showing a realitvely featureless facing side (between +/-90 degrees) and eastern horizon (-120 to -90 degrees), with any newly-developed arriving regions (white areas) appearing to be small.



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Solar Wind / Geomagnetic Activity: There are several (up to four) glancing incidence CMEs possible in the forecast period, with forecast arrivals up to and including the middle of the UTC week. In addition, a fast solar wind regime is likely to develop, starting from day one and perhaps reinforced midweek, with the risk period roughly coincident with the CME arrival threat. It goes without saying that the resultant forecast is very low confidence in timing and phasing of Minor Storm G1 risk through the start of the UTC week, but confidence is nonetheless higher for this being the maximum in attained geomagnetic activity.

In the absence of any CMEs, geomagnetic activity should be greatest in the first half of the UTC week, but probably below Minor Storm G1, later waning after midweek.

Energetic Particles / Solar Radiation: No solar radiation storms are expected given the dearth of significant sunspot groups.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	20	20	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	1	1	1	1
Very Active	R3 to R5 X	No	1	1	1	1

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Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	1	1	1	1
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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